

BARBUKOVA, V.I., kand. ist. nauk; DEMIDOVA, Z.F., kand. ist. nauk;  
POSELYANINA, O.K., kand. ist. nauk; SORIN, Yu.N., kand.  
ist. nauk; SHATVOROVA, V.D., kand. ist. nauk; KHRUSHCHEV,  
V.I.; STARODUSTSEV, N.I.; SHVETS, I.Ye.; TOROPCHIN, N.B.;  
~~red.~~; IVANOVA, R.N.; tekhn. red..

[Krasnyi Aksay; from the history of the M.V.Frunze Rostov  
Plant of Agricultural Machinery] Krasnyi Aksai; iz istorii  
Rostovskogo zavoda sel'skokhoziaistvennogo mashinostroeni-  
ia imeni M.V.Frunze. Rostov-na-Donu, Rostovskoe knizhnoe izd-  
vo, 1962. 158 p.  
(MIRA 15:9)

1. Prepodavateli Rostovskogo gosudarstvennogo universiteta  
(for Barbukova, Demidova, Poselyanina, Sorin, Shatvorova).
2. Otvetstvennyy sekretar' mnogotirazhnoy gazety "Krasnyy  
aksayets" (for Khrushchev). 3. Zaveduyushchiy kabinetom po-  
liticheskogo prosveshcheniya partiynogo komiteta Rostovskogo  
zavoda sel'skokhozyaystvennogo mashinostroyeniya "Krasnyy  
Aksay" (for Starodubtsev). 4. Rabochiy remontno-mekhanicheskogo  
tsentral'nogo zavoda sel'skokhozyaystvennogo mashino-  
stroyeniya "Krasnyy Aksay" (for Shvets ).

(Rostov-on-Don---Agricultural machinery)

MURAV'YEV, S., brigadir; DENNIK, F.; KOLESOV, O.; TOROPCHIN, S.;  
KOROLEV, I.; AGZAMOV, D., gornyy master

To live and work the communist way. Sov.shakht. 10 no.12:4-11  
D '61. (MIRA 14:12)

1. Zhakhta No.1 "TSentral'naya" tresta Krasnoarmeyskugol' (for Murav'yev).
2. Zamestitel' sekretarya partorganizatsii Shakhty No.1 "TSentral'naya" tresta Krasnoarmeyskugol' (for Dennik).
3. Nachal'nik shakhty "Kommunist-Novaya" tresta Oktyabr'ugol' (for Kolesov).
4. Predsedatel' komiteta profsoyuza shakhty "Kommunist-Novaya" tresta Oktyabr'ugol' (for Toropchin).  
(Coal miners)

TOROPCHIN, S.

Year of great accomplishments. Sov. shakh. 11 no.10:5-6 O  
'62. (MIRA 15:9)

1. Predsedatel' komiteta profsoyuza donetskoy shakhty  
"Kommunist-Novaya" tresta Oktyabr'ugol'.  
(Donets Basin--Coal mines and mining)

BUSHE, N.A., doktor tekhn. nauk; DVOSKINA, V.A., inzh.; TOROPCHINOV, A.N. , inzh.

Evaluating the properties of bearing alloys operating with various  
lubricants and cast iron and steel rollers (journals). Trudy TSNII  
MPS no.277:16-43 '64. (MIRA 17:6)

TOROPCHINOV, A.N., inzh.

Methodology for evaluating the lubricating properties of lubricants.  
Vest. TSNII MPS 23 no.1:36-39 '64. (MIRA 17:4)

VOLKOV, V.N.; GAVRILOVA, O.I.; TOROPETS, S.A.

Relationship between specific gravity and density in the peat -  
anthracite series. Izv. AN SSSR.Ser.geol. 28 no.8:86-96 Ag '63.  
(MIRA 17:2)

1. Ekspeditsiya No.5 Vsesoyuznogo nauchno-issledovatel'skogo geologicheskogo instituta, Leningrad.

ACC NR: AR6033765

SOURCE CODE: UR/0058/66/000/007/A020/A020

AUTHOR: Kayak, L. K.; Toropin, S. I.; Trishin, N. V.; Yachmentsev, O. V.

TITLE: Double photoelectric microscope for comparing subdivisions of caliper  
measures of length <sup>q/m</sup>

SOURCE: Ref. zh. Fizika, Abs. 7A173

REF SOURCE: Tr. in-tov Gos. kom-ta standartov, mer i izmerit. priborov  
SSSR, vyp. 78(138), 1965, 49-63

TOPIC TAGS: microscope, error measurement, measurement

ABSTRACT: A double photoelectric microscope and special electronic equipment for measuring the differences in length of comparable caliper measures are described. An investigation of measurement accuracy is carried out. The use of the device increases the efficiency of comparison by a considerable factor and permits the reduction of measurement errors. Bibliography of 10 titles. Ye. Ki-yaev. [Translation of abstract]

SUB CODE: 14/

Card 1/1

ACC NR: AT7000581

SOURCE CODE: UR/2589/65/000/078/0049/0063

AUTHOR: Kayak, L. K.; Toropin, S. I.; Trishin, N. V.; Yachmentsev, O. V.

ORG: VNIIM

TITLE: Dual photoelectric microscope for comparison of divisions on linear scales

SOURCE: USSR. Komitet standartov, mer i izmeritel'nykh priborov. Trudy institutov Komiteta, no. 78(138), 1965. Issledovaniya v oblasti lineynikh izmereniy (Research in the field of linear measurements), 49-63

TOPIC TAGS: ~~photoelectric~~ microscope, photoelectric method, photoelectric tracking, optic scanning, photoelectric scanning, automatic scale reading equipment, metrology

ABSTRACT: A dual photoelectric scale comparator microscope for direct measurement of linear displacement differences between two scales is described. This instrument has the advantage over the majority of photoelectric microscopes designed for line alignment in that it generates through electronic means a direct readout of the difference between two linear scales under comparison. This is possible due to the conversion of linear displacement into the corresponding time interval that can be very accurately measured by conventional methods. The principle of operation is as follows: The images of lines on the scale are scanned by means of a vibrating mirror in the plane of a fixed slit. At the instant of the crossing of the slit by the line image the light

Card 1/3

ACC NR: AT7000581

flux is modulated, and a photodetector converts the modulated light into electrical impulses. An electrical coincidence circuit generates an output pulse if, and only if the pulses generated during the forward and during the reverse motion of the mirror coincide, i. e., the optical axis of the instrument coincides with the center of the line being scanned. There are two independent scanning systems, one for each scale, which are identical in construction and operation. When the position of two lines on two scales is compared the pulse which occurs first, when both scanners traverse their respective scales (the scales are mounted on precision tables driven at uniform speed through lead screws), opens a gate which admits pulses from a calibrated pulse generator into a bidirectional counter. The second pulse from the photoelectric microscope turns the gate off. The relation between the pulse repetition rate, the scanning speed, and the units of length is accurately known and fixed. Hence, the pulse count displayed on the counter is an accurate measure of the difference in the position of the marks on the two scales being compared. Two versions of the instrument are described: one for comparing two parallel scales, the other for scanning two scales located one behind the other on the same axis. The optical system of the latter version is shown in Figure 1. The scales 7 and 7' are illuminated by the light source 3. Two identical optical systems image the scale lines into the plane of two fixed slits 1 and 1', respectively. The scanning of the line images across the fixed slits is due to the motion of the vibrating mirrors 8 and 8'. The modulated light is converted into electrical signals by the photodetectors 4 and 4'. The authors have experimentally investigated the accuracy of both systems and found it to be well below one micron

Card 2/3

ACC NR: AT7000581

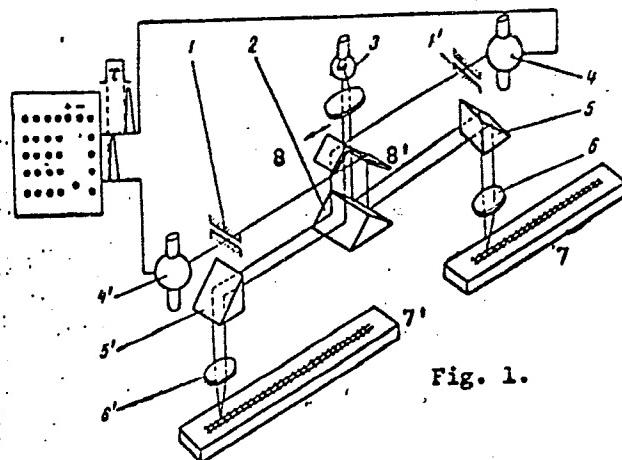


Fig. 1.

(total error). The effects of various instabilities in the optical, mechanical, and electronic systems on the magnitude of error are discussed and the results of actual measurements included. Orig. art. has: 7 figures, 4 tables.

SUB CODE: 09,14/

SUBM DATE: 08Jul64/

ORIG REF: 008/

OTH REF: 002

Card 3/3

TOROPIN, S.I.

Determination of optimum values of the scale division and the  
variations of the readings of scales. Izm. tekhn. no. 7811-13  
(MIRA 16:8)  
Jl '63.

(Scales (Weighing instruments) -- Testing)

TOROPKIN, I.

Erected by the hands of young Sakhalin builders. Mast.ugl.  
8 no.2:10 F '59. (MIRA 13:4)  
(Sakhalin Basin--Labor and laboring classes--Dwellings)

TOROPCHIN, N.F., fel'dsher (Aleysk Altayskogo kraya).

Thirty-five years of public health service of Feldsher V.I.Palkina. Fel'd.i  
akush. no.10:56-57 O '53. (MLRA 6:10)  
(Palkina, Varvara Ivanova)

1. TOROPCHIN, N. F.
2. USSR (600)
4. Public Health
7. Medical center at the collective farm "Pravda."  
Fel'd. i akush. №.10, 1952
9. Monthly List of Russian Accessions, Library of Congress, January 1953. Unclassified.

GOZULOV, A.I., doktor ekonom. nauk, prof.; SHUMILIN, P.G., kand. ekonom. nauk, dots.; SHESTAKOV, P.A., red.; SHNEYDERMAN, K.A., red.; TOROPCHIN, N.S., red.; ZHEREBKOV, I.V., red.; IVANOVA, R.N., tekhn. red.

[Rostov Province; nature, population, economy and culture]  
Rostovskaya oblast'; priroda, naselenie, khoziaistvo, kul'tura.  
Rostov-na-Donu, Rostovskoe knizhnoe izd-vo, 1961. 333 p.  
(MIRA 15:3)

(Rostov Province--Economic geography)

TOROPCHIN, S.E., inzhener.

Automatic operation of pumping stations. Torf. prom. 33 no.8:  
20-22 '56. (MLRA 10:2)

1. Glavtorf.  
(Pumping stations) (Automatic control)

TOROPCHIN, S. F.

ROZENBERG, B.I., inzhener; TOROPCHIN, S.F., inzhener.

For uninterrupted operation of electric equipment of peat enterprises in 1957. Torf. prom. 34 no.3:9-13 '57. (MLRA 10:5)

1. Glavnoye upravleniye torfyanoy promyshlennosti.  
(Peat industry--Equipment and supplies)

Toropchin, S.F.

ROZENBERG, B. I., inzhener; TOROPCHIN, S.F., inzhener

Results of providing peat machinery with electric equipment. Torf.  
(MLRA 8:12)  
prom. 32 no. 6:8-11 '55.

1. Glavnaya upravleniya torfyany promyshlennosti  
(Peat machinery) (Electric machinery)

TOROPCHIN, S.F., inzhener.

Economizing electric power in peat enterprises. Torf.prom.  
33 no.2:12-14 '56. (MLRA 9:6)

1.Glavtorg.  
(Peat industry) (Electric power)

SCV/170-59-4-6/20

18(4)

AUTHORS:

TITLE:

PERIODICAL:

ABSTRACT:

ASSOCIAT.

APPROVED FOR RELEASE: 08/31/2001

CIA-RDP86-00513R001756330001-5

Bushe, N.A., Dvoskina, V.A., Tropchinov, A.N.  
 The Role of Soft Structural Components in Antifriction Alloys  
 (rol' myagkikh strukturnykh sostavlyayushchikh v antifriktions-  
 nykh splavakh)

Inzhenerno-fizicheskiy zhurnal, 1959, Nr 4, pp 38-46 (USSR)

Aluminum alloys coming now into wide use contain some soft metals such as lead, tin or cadmium, as structural components. It was noticed that antifrictional properties of these alloys considerably depended upon the percentage of the soft structural components. A.A. Bochvar [Ref 2] on the one hand explained in different ways the manner in which the positive effect of this soft component comes into being. In order to elucidate the problem the TsNII MPS carried out investigations of tin-containing aluminum alloys with a friction machine of the MI-type. Conditions of experiments were the following: semi-liquid friction was brought about by using diesel oil of the D-11 type heated to 100°C; specific pressure was 75 kg/cm<sup>2</sup>; the speed of shaft revolution was 450 rpm; material of the journal was axl.

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the transfer of tin from the surface of the steel led to the formation of the same effect of re-

Card 1 of 2 English. Authors as-  
 zhnogo transporta (Institute of Railroad

TROPCHINOV, A.N.  
 SHADIKYAN, V.S., kandidat tekhnicheskikh nauk; TROPCHINOV, A.N., inzhener.  
 Determining wear resistant properties of oils with the aid of radioactive isotopes. Vest. TSNII MPS 15 no.1:17-22 Ag '56.  
 (Oil analysis) (MLRA 9:12)

SHADIKYAN, V.S., kand.tekhn.nauk; TOROFCHINOV, A.N., inzh.

Method for estimating wear resistance properties of diesel  
lubricants by means of radioactive isotopes. Vest.TSNII MPS  
19 no.6:13-17 '60.

(Diesel locomotives--Lubrication) (MIRA 13:9)  
(Radioisotopes--Industrial applications)

ROZENBERG, B.I., inzhener; TOROPCHIN, S.F., inzhener.

Using vacuum impregnation and pulverization equipment in  
electric repair shop. Prom.energ. 12 no.9:4-6 S '57. (MIRA 10:10)  
(Electric machinery--Maintenance and repair)

BUSHE, N.A.; DVOSKINA, V.A.; TOROPCHINOV, A.N.

Role of soft structural components in antifriction alloys [with  
summary in English]. Inzh.-fiz. zhur. no.4:38-46 Ap '59.  
(MIRA 12:5)

I. Institut zheleznodorozhnogo transporta, g. Moskva.  
(Bearing metals--Metallography)

TOROPCHINOV, N. A., Engineer

JANUARY 1961

Dissertation: "Investigation of High-Speed Methods for Machining the Rims  
of Wheel Pairs."

21/6/50

Moscow Order of the Labor Red Banner Electromechanical Inst of Railroad  
Engineers imeni F. E. Dzerzhinskiy

**SO Vecheryaya Moskva  
Sum 71**

BALON, I.D., kand.tekhn.nauk; ROMANENKO, N.T., inzh.; YUPKO I.D., inzh.;  
BOLKUNOV, Ye.P., inzh.; TULUYEVSKAYA, T.A., inzh.; ASAFUROV, P.I., inzh.;  
VOLOVIK, A.V., inzh. Prinimali uchastiye: BAKAYEV, A.A.; VOKHNIK, A.R.;  
KOLOS, V.D.; KAYSTRO N.P. [deceased]; LITVINENKO, V.I.; MAKARCHENKO, N.M.;  
ONOPRIYENKO, V.P.; PALAGUTA, V.P.; PIKA, V.S.; RAGIN, B.I.; ROMANCHENKO,  
Ye.I.; SAYENKO, S.D.; STOLYAR, V.V.; SKORIK, N.M.; TOROPENKO, P.D.

Characteristics of making ferromanganese in large capacity blast furnaces  
and the effect of slag conditions on basic technical and economic indices.  
(MIRA 17:2)  
Stal' 23 no.12:1069-1073 D '63.

1. Ukrainskiy nauchno-issledovatel'skiy institut metallov i zavod "Zapo-  
rozhstal".

GORPADE, Al., ing.; POPESCU, Gabriel F., Ing.; TORPENYI, L., ing.;  
JUDE, A., ing.

Fighting dilution during the exploitation in mining complex  
ores veins. Rev min 12 no.5:207-215 My '61.

Toropova, T. I.

SOV/SCS8

## PAGE 1 BOOK EXPLOITATION

3(1)	Astrofizicheskiy Institut Akademika Nauk Kazakhskoy SSR. Astrofizicheskiy Institut Institut, Com. VIII. (News of the Astrophysics Institute, Kazakh SSR Academy of Sciences), vol. 8) Almaty, Izd-vo Akademicheskoy SSR, 1959. 650 copies printed. Eds.: V. D. Gerasimov and Yu. A. Kuznetsov. Tech. Ed.: S. P. Borodina. Material Prepared by D. M. Ialil, M. G. Barinov, G. V. Karygina (Secretary), D. A. Barinov, V. D. Krasnikov (Sup. Ed.).	
	PERIOD: This collection of articles is intended for geophysicists and astronomers.	
	CONTENTS: This collection of articles contains studies on the distribution of asteroids as revealed by astrophysical characteristics, the distribution of the luminosity curve of a variable star, the integrals of motion of an individual star, the electromagnetic mechanism in solar prominences, sky polarization in the Loran desert, projector research etc. English abstracts accompany each article. References follow individual articles.	
	MURKIN, V. A. Asymmetry Coefficients of the Atmosphere in the Ultraviolet by Observing Several Stars	53
	BARINOV, M. G. The Yellow Coronal Line 5694 Å from Observations Outside Ecliptic	59
	GOLODOV, S. O. Electromagnetic Mechanism of Heating Solar Prominences	64
	KARYGIN, G. V. The Low-Latitude Aurora on September 29-30, 1957	68
	GORYAINOV, E. Kh. Spectral Photography in the Red Spectrum Part of the Visible Range on Sept 29-30, 1957	79
	GOVOROV, N. N. Some Data on Polarization in the Sky in Central Kazakhstan, Jan. V. Some Data on Polarization in the Sky in Northern Egypt	82
	BORISOV, P. I., G. Sh. LIVSHITZ, and T. P. RUMYANTSEVA. Projector Studies of The Indicators of Light Scattering	93
	BORISOV, P. I. Spectroelectrophotometer Equipped With an Aromatic Spectrum Recorder	100

TOROPIN, S.I.

Precision of the measurement of temperature of standards of length  
in checking them with comparators. Trudy inst.Kom.stand.,mer i izm.  
(MIRA 15:12)  
prib no.47:49-62 '61.

1. Vsesoyuznyy nauchno-issledovatel'skiy institut metrologii im.  
D.I.Mendeleyeva.  
(Thermometry) (Length measurements)

KAYAK, L.K.; TOROPIN, S.I.

The thirty-meter interference comparator of the All-Union Research  
Institute of Metrology. Trudy inst.Kom.stand.,mer i izm.prib no.47:  
(MIRA 15:12)  
92-112 '61.

1. Vsesoyuznyy nauchno-issledovatel'skiy institut metrologii im.  
D.I.Mendeleyeva.  
(Length measurement)

KAYAK, L.K.; TOROPIN, S.I.

Photoelectric microscopes for comparing hatched length measures.  
(MIRA 13:6)  
Izm.tekh. no.2:3-5 F '60.  
(Photoelectric measurements)

25(6)

S/115/60/000/02/031  
D002/D003AUTHORS: Kayak, L.K., Toropin, S.I.TITLE: Photoelectric Microscopes for Checking Line Standards

PERIODICAL: Izmeritel'naya tekhnika, 1960, Nr 2, pp 3-5 (USSR)

ABSTRACT: The method of checking line standards by means of special photoelectric microscopes is under development in the USSR and abroad, e.g. in Switzerland [Ref 1], and England [Ref 2]. This work was continued at VNIIM. The article contains information on the test unit of a photoelectric microscope (Figure 1) used not only for focussing on the line but also for direct measurement of length differences compared on the line-standard comparator. The working principle is the following: When the moving image of the "STs79" lamp's filament passes over the line of the line standard, the light flow is reduced, and this is recorded by a photocell converting the light flow change into an electric signal. On the screen

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S/115/60/000/02/031  
D002/D003

Photoelectric Microscopes for Checking Line Standards

of the oscillograph, the passing of the filament image over the line is shown by a swing. The micrometer of the test microscope has a scale with 0.09 micron divisions. The medium spare error is  $\pm 0.15$  microns. Another microscope (Figure 2) with two objectives for observing the lines of two line standards at a time, was also developed. It is assembled on a one-meter measuring device. There are 2 diagrams and 3 references, of which 1 is English, 1 French and 1 Soviet.

Card 2/2

"APPROVED FOR RELEASE: 08/31/2001

CIA-RDP86-00513R001756330001-5

\* 7389. *Igoratin, S. L.* THE DIFFERENTIAL ENTHALPY OF PROTONATION

APPROVED FOR RELEASE: 08/31/2001

CIA-RDP86-00513R001756330001-5"

"APPROVED FOR RELEASE: 08/31/2001

CIA-RDP86-00513R001756330001-5

APPROVED FOR RELEASE: 08/31/2001

CIA-RDP86-00513R001756330001-5"

TOROPIN, S.I.

Differential physical pendulum with a system of knife edge and  
support. Trudy VNIIM no.23:5-17 '54. (MIRA 11:6)  
(Gravimeter) (Pendulum)

TOKOPIN, S. I.

TOROPIN, S.I.

Effect of the knife edge and support on the absolute determination  
of gravity acceleration by means of pendulums. Trudy VNIIM no.23:  
18-25 '54. (MIRA 11:6)

(Gravity) (Pendulum)

TOROPIN, S.I.

Eliminating the effect of vibration of the stand in the absolute determination of acceleration due to gravity as measured by a torsion pendulum. Trudy VNIIM no.23:26-31 '54. (MIRA 11:6)  
(Gravity) (Pendulum)

TOROPIN, S. I.

"Differential Physical Pendulum With One System Prism-Cushion", Tr. Vses.  
n-i in-ta Metrologii, No 23, pp 5-7, 1954.

Attempt is made to eliminate a certain indefiniteness of the rotational axis, due to elastic strain of prism and cushion, on which the pendulum is suspended. A differential pendulum with one prism, leaning on one cushion, is suggested to this end. Two mobile loads are attached in the suggested construction as auxiliary tests of accuracy. The possible error does not exceed  $\pm 3$  mgr. (RZhAstr, No 11, 1955)

SO: Sum 812, 6 Feb 1956

TOROPIN, S. I.

"Elimination of the Oscillatory Effect of the Support During Absolute Determination of Acceleration of Gravity by Means of Rotatable Pendulums,"  
Tr. Vses. n. -i. in-ta metrologii, No 23, 1954, pp 26-31

Two rotatable pendulums are considered, one with parameters of mass M, length L, and period T, and the other with corresponding m, l, and t. It is demonstrated that if the pendulums swing on one support imparting oscillations to the latter and producing a horizontal shift of the rotational axis, then the gravity acceleration  $g_L$  as a result of measurement by these two pendulums, may be expressed, using a differential method, by

$$g_L - g_T \approx \frac{L - l + \frac{\epsilon}{M} (M-m)}{M+m}$$

where  $\epsilon$  is the elasticity constant ( $M\text{-t}^{-2}$ ) of the support.

RZhFiz, No 3, 1955

TOROPIN, V., agronom.

Closer to the life of agricultisalists. Zemledolie 5 no.3:65  
Mr '57. (MLRA 10:3)

1. Kalininskaya Mashinno-traktormaya stantsiya, Kalininskoy oblasti.  
(Agriculture--Periodicals'

TOROPIN, Ye.V., aspirant

Using the quadrilateral method in determining the coordinates of  
points in the preliminary laying out of a construction net.  
Trudy MIIGAIK no.47:51-61 '61. (MIRA 15:7)

1. Kafedra prikladnoy geodezii Moskovskogo instituta inzhenerov  
geodezii, aerofotos"zemki i kartografii.  
(Surveying)

IGOLKIN, N.I., inzh.; TOROPIN, Yu.A.

Putting down rough wearing surfaces. Avt.dor. 24 no.5:17-18 My  
'61. (MIRA 14:6)  
(Road construction)

TOROPKIN, I.

Fourth Sakhalin mine. Mast. ugl. 7 no.11:16-17 N '58. (MIRA 11.)  
(Sakhalin Basin--Coal mines and mining)

TOROPKIN, I. (g.Gornozavodsk, Sakhalinskaya oblast')

Sakhalin innovators. Mast. ugl. 8 no.8:4 Ag '59.  
(MIRA 12:12)

(Sakhalin--Coal miners)

TOROPIN, Ye.V.

Scale of the topographic foundation for the design of industrial  
enterprises. Geod. i kart. no.7:40-42 Jl '60. (MIRA 13:9)  
(Topographical surveying)

BIBERMAN, L.M.; TOROPKIN, Yu.N.; UL'YANOV, K.N.

Theory of stepwise ionization and recombination. Zhur.tekh.fiz.  
32 no.7:827-834 Jl '62. (MIRA 15:8)

1. Moskovskiy energeticheskiy institut.  
(Ionization) (Electrons)

38931  
S/057/62/032/007/006/013  
B104/B102

26.2340  
AUTHORS:

Biberman, L. M., Toropkin, Yu. N., and Ul'yanov, K. N.

TITLE:

Theory of stepwise ionization and recombination

PERIODICAL: Zhurnal tehnicheskoy fiziki, v. 32, no. 7, 1962, 827-834

TEXT: Considering radiative recombination by which a many-electron excited atom is formed, the probabilities for ionization of excited atoms by radiation and by electron impact are investigated, as well as the probabilities for the corresponding recombinations. The coefficient

$$\alpha = 1.04 \cdot 10^{-11} T^{-1/2} [\ln(1.78 u_e - e^{\alpha E_i(u_e)})]$$

for the spontaneous recombination of a hydrogen atom in the n-th state is obtained from the expression

$$\alpha_n = \frac{2^9 \pi^{1/2} e^{10}}{6^{1/2} m^{1/2} \alpha^3 h^3 (kT)^{1/2}} \frac{1}{n^3} e^{\frac{1}{n^2 kT}} E_1\left(\frac{1}{n^2 kT}\right)$$

derived by G. Elwert (Zs. f. Naturforsch., 7a, 432, 1952) by summation

Card 1/2

TOROPKIN, Yu.

The first-born of the cultural three-year plan. Prof.-tekhn.obr.  
17 no.3:24 Mr '60. (MIRA 13:6)  
(Kazakhstan --Intellectual life)

TOROPKINA, Yu.I.; MOSHKEVICH, V.S.

Pathology of the thyroid gland in inhabitants of two regions of  
central Kazakhstan. Zdrav.Kazakh. 22 no.7:15-17 '62.

(MIRA 16:1)

1. Iz Instituta krayevoy patologii (direktor - kand.med.nauk  
B.A. Atchabarov) AN Kazakhskoy SSR.  
(KARAGANDA PROVINCE—THYROID GLAND—DISEASES)

TOROPKINA, Yu.I.; VELIKANOV, I.I.

Cardiovascular and respiratory function in silicosis. Izv. AN Kazakh.  
SSR. Ser. med. i fiziol. no.1:29-44 '59. (MIRA 13:1)  
(CARDIOVASCULAR SYSTEM) (RESPIRATION) (LUNGS--DUST DISEASES)

TOROPKINA, Yu.I.

Results of treating silicosis and other nontuberculous pulmonary diseases at the Borovoye health resort. Trudy Inst. Kraev. pat.  
AN Kazakh SSR 5:43-49 '57. (MIRA 11:2)

(LUNGS--DISEASES)  
(BOROVOYE--THERAPEUTICS, PHYSIOLOGICAL)

TOROPKINA, Yu I.

BERLEMISHEV, N.D.; ZHELEZNIKOV, I.G.; TOROPKINA, Yu.I.

Prospects of building a sanatorium for silicosis patients in Kazakhstan.  
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(LUNGS--DUST DISEASES)  
(Burovoi--CLIMATOLOGY, MEDICAL)

TOROPKINA, Yu. I.

Toropkina, Yu. I. -- "Experiment in Treating Patients with Silicosis and Other Lung Infections of Non-Tubercular Etiology at the Borovoye Spa." Inst of Physiology, Inst of Regional Pathology, and Inst of Experimental Surgery, Acad Sci Kazakh.SSR. Alma-Ata, 1956. (Dissertation For the Degree of Candidate in Medical Sciences).

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Effective utilization of artesian and underground waters in the  
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(Caspian Lowland--Water, Underground)

TOROPKOVA, A.A., inzh.

Joint thermal operation of ovens and kilns for tiles. Stroi.  
mat. 9 no.7:23 J1 '63. (MIRA 16:11)

GOL'DMAN, A.G., akademik; TOROPKOVA, L.V.

Infrared electoluminescence of cuprous oxide. Dokl. AN SSSR  
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1. Institut fiziki AN UkrSSR. 2. AN UkrSSR (for Gol'dman).  
(Luminescence) (Copper oxides)

TOROPOGRITSKIY, D. P.

Afforestation - Kharkov (Province)

Spot seeding of oak on the northern steppe. Les i step ,4, No.2, 1952

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4030

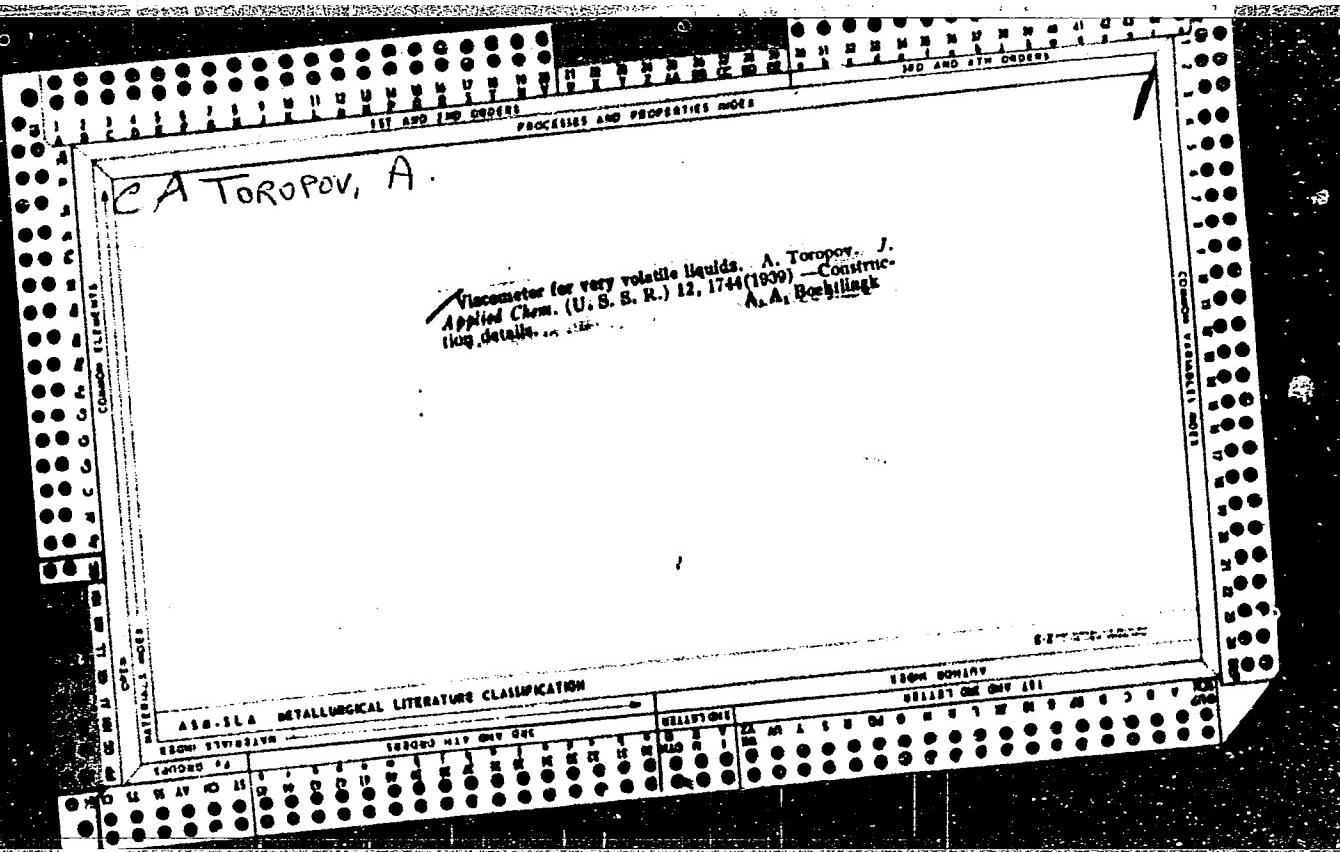
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red.

[Master of welding] Master ognennogo dela. Moskva, Gospolitizdat,  
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APPROVED FOR RELEASE: 08/31/2001

**CIA-RDP86-00513R001756330001-5"**

TOROPOV, A.A., inzh.; MAKIVCHUK, V.F., inzh.

Designing impulse pressure feeding systems of two-cycle diesel engines. Energomashinostroenie 7 no.7:37-39, 48 Jl '61.  
(Diesel engines)  
(Fuel pumps)

TOROPOV, A.A., inzh.; MAKIVCHUK, V.F., inzh.

Calculation and choice of the circuit of a supercharged diesel engine with constant gas pressure before the turbine. Energomashino-stroenie 9 no.6:18-20 Je '63. (MIRA 16:9)

TOROPOV, A.A., kand.med.nauk; ARYAYEV, L.N., kand.med.nauk; TOMCHUK, P.F.,  
meditsinskaya sestra-narkotizator (Odessa)

Work of the anesthesiological nurse. Fel'd. i akush. 26 no. 2:48-51  
(MIRA 14:4)  
F '61. (ANESTHETISTS)

"APPROVED FOR RELEASE: 08/31/2001

CIA-RDP86-00513R001756330001-5

APPROVED FOR RELEASE: 08/31/2001

CIA-RDP86-00513R001756330001-5"

KOROLEVA, V.A., MEL'NIKOV, A.I., TOROPOV, A.G., SAFRONOVA, R.Ya.

Avoiding waviness of hot-rolled electrical steel sheets. Metal-  
lurg 5 no.7:28- 9 Jl '60. (MIRA 13:7)

1. Versh-Isetskiy metallurgicheskiy zavod.  
(Sheet steel) (Annealing of metals)

PETRICHENKO, A.M.; SOLNTSEV, L.A.; BURAKOV, L.M.; TOROPOV, A.I.

Investigating distributing shafts made of magnesium cast iron.  
Lit. proizv. no.6:22-23 Je '62. (MIRA 15:6)  
(Cast iron—Testing) (Shafting—Testing)

VOROB'YEV, S.A., kand.tekhn.nauk, otv.red.; KONOVALOV, A.I., inzh., red.;  
MAKARENKO, V.P., inzh., red.; MIKHEYEV, M.V., inzh., red.; NOVIKOVA,  
N.T., inzh., red.; PIKHTOVNIKOV, R.V., prof., red.; PODLOZHENOV,  
P.M., inzh., red.; SEMKO, M.F., prof., red.; TOROPOV, A.I., inzh.,  
red.; TSERKOVNYY, I.M., inzh., red.; CHERKASHIN, I.P., inzh., red.;  
SHEVCHENKO, M.G., tekhn.red.; LIMANOVA, M.I., tekhn.red.

[Mechanization and automation of production processes; proceedings  
of the city technical conference] Mekhanizatsiya i avtomatizatsiya  
proizvodstvennykh protsessov; sbornik materialov gorodskoi tekhnicheskoi  
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1959. 295 p. (MIRA 13:1)

1. Kommunisticheskaya partiya Ukrayny. Khar'kovskiy gorodskoy  
komitet. 2. Nachal'nik Ukrainskoy proyektno-konstruktorskoy  
kontory "Prommekhanizatsiya". (for TSerkovnyy).  
(Automation) (Technological innovations)

SOV/128-58-11-1/24

AUTHORS: Gorshkov, A.A., Toropov, A.I., Voloshchenko, M.V. and Prozhoga, K.K.

TITLE: Magnesium Cast Iron Crankshafts for Diesel Tractor Engines  
(Kolenchatyye valy dlya dizel'nykh traktornykh dvigateley iz magniyevogo chuguna)

PERIODICAL: Liteynoye proizvodstvo, 1958, Nr 11, pp 1-3 (USSR)

ABSTRACT: Information is presented on experience in the production of magnesium cast-iron crankshafts at the Khar'kov Tractor Plant and the "Serp i molot" Plant, with the participation of Academician A.A. Vasilenko, engineers L.L. Yurovskiy, T.M. Belov, S.V. Timchenko, B.K. Krymov, I.K. Udovikov, A.P. Mel'nikov, A.G. Sherman, I.G. Neizhko; Candidates of Technical Sciences I.S. Grigor'yev, N.B. Gel'perin and other workers of the "Serp i molot" Plant and the Institut mashinovedeniya (Institute of Mechanical Engineering) AS UkrSSR and NII Traktorosei'mash. Good results were obtained in the experiments and the wear-resisting properties of the cast crankshafts proved to be 30 to 40 % higher than those of forged steel shafts. In developing the casting technology special attention was de-

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SOV/128-58-11-1/24

Magnesium Cast Iron Crankshafts for Diesel Tractor Engines

voted to the double modification process obtained by separate subsequent addition of ferrosilicon in a certain time interval after the addition of magnesium. It was stated that positive results of the double modification process depend on the composition of the initial cast iron. According to technical conditions, the structure of cast crankshafts for diesel engines must consist of laminated perlite with different dispersion, globular graphite and up to 25 % ferrite. It was stated that the ferrosilicon content must be increased up to 0.55 %. The casting was carried out on a special conveyor. After machining, the cast shafts were subjected to tests on gamma flaw-detectors with radioactive cobalt radiation and on magnetic flaw-detectors.

There are 4 photos, 2 diagrams, 1 graph and 3 references, 2 of which are Soviet and 1 English.

- 1. Crankshafts--Production
- 2. Iron-magnesium castings--Applications
- 3. Crankshafts--Mechanical properties
- 4. Crankshafts--Inspection

Card 2/2

VOLOSHCHENKO, M.V.; TOROPOV, A.I.

Some characteristics of the production of crankshafts from  
high strength cast iron for SMD diesels. Nauk.pratsi Inst.lyv.  
vyrob.AN URSR 9:73-81 '60. (MIRA 15:3)  
(Iron founding) (Cranks and crankshafts)

DREVETNYAK, P.P.; KOROTKOV, A.G.; TOROPOV, A.I.; BARANOVA, N.B.

Fatigue strength of the cast crankshafts of the SMd-14 diesel engines.  
Trakt. i sel'khozmash. no.7:35-36 Jl '65. (MIRA 18:7)

1. Nauchno-issledovatel'skiy institut tekhnologii traktornogo i sel'skokhozyaystvennogo mashinostroyeniya (for Drevetnyak, Korotkov).
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VOLOSHCHENKO, M.V.; TOROPOV, A.I.

Effect of residual magnesium on the shape of graphite. Lit. prcizy.  
no. 5:30 My '61. (MIRA 14:5)  
(Cast iron—Metallography)

Toropov, A. M.  
P.3

PHASE I BOOK EXPLOITATION

SOV/3240

84(7)

Leningrad. Inzhenerno-ekonomicheskiy institut

Primeneniye rentgenovykh luchey k issledovaniyu materialov (Application of X-Rays in the Study of Materials) [Leningrad] Izd-vo Leningradskogo univ., 1959. 125 p. (Series: It's: Trudy, vyp. 28) Errata slip inserted. 2,000 copies printed.

Ed. (Title page): Yu. S. Terminasov, Professor, and T. N. Smirnova, Docent; Ed. (Inside book): N. I. Busorgina; Tech. Ed.: S. D. Vodolagina.

PURPOSE: This book is intended for specialists and students in educational institutions working in x-ray analysis.

COVERAGE: This book contains 12 studies prepared by the staff of the Department of Physics and of other departments of the Leningrad Engineering and Economics Institute in cooperation with industrial enterprises. The studies deal with the fatigue of metals and alloys, wear of metals due to friction, and the state of surface layers of metals subjected to preliminary hardening.

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## ' Application of X-Rays (Cont.)

SOV/3240

The scientists applied the x-ray method of analysis to poly-crystalline metals and alloys, to single crystals of metals, and to tempered and surface hardened steel. Residual stresses due to thermal treatment (Type I) and grinding (Type III) are the subject of a special study with a view to their role in the development of surface cold-hardening and their influence on the grinding process. Considerable attention is paid to the force-feed metal-cutting method of V. A. Kolesov, and to a method of surface hardening of metals by shot blasting. References follow each article.

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## Application of X-Rays (Cont.)

SOV/3240

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Karashev, T., and Yu. S. Terminasov. X-ray Study of Types I and III Residual Stress in the Wear of Steel Samples During the Friction Process	83

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Card 4/4

- 125 AVAILABILITY: Library of Dognerean  
Device for Charging Samples Without Upsetting the Vacuum  
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113 Structure Detorizations in Surface Layer of Metals Cut by  
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105 Blasted Cold Hardened Steel by the X-ray Method  
Myasnikov, Yu. O., And Yu. S. Terminakov, Studying Shot  
96 Wear of Initial Surface Hardened Metals  
Abduzhina, Z. M., And Yu. S. Terminakov, X-ray Study of  
SOV/3240 Application of X-rays (cont.)

TOROPOV, Anatoliy Konstantinovich; AGAPOV, V.M., red.; SERGEYEVA, N.A.,  
red. izd-va; GURSOVA, O.A., tekhn. red.

[Mobile electric power plants and electric equipment for prospecting] Perekvizhnye elektrostantsii i elektrorudovanie geologo-razvedochnykh rabotakh. Moskva, Gos.nauchno-tekhn.izd-vo lit-ry po geol. i okhrane nedr, 1961. 202 p. (MIRA 14:12)  
(Electric power plants) (Prospecting--Electric equipment)

TERMINASOV, Yu.S.; TOROPOV, A.M.

X-ray investigation of distortions in the crystal structure  
of 45 steel, aluminum, and red copper subjected to fatigue  
tests. Trudy LIEI no.28:51-60 '59. (MIRA 13:4)  
(Metal crystals--Testing) (Metallography)

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18. 8200

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S/139/59/000/05/016/026  
E091/E191

AUTHORS: Buyko, V.M., Makogonov, V.Ye., Terminasov, Yu.S., and  
Toropov, A.M.

TITLE: X-ray Study of the Mechanism of Fatigue in Ferrous and  
Non-Ferrous Materials and Alloys (Mono- and Poly-  
Crystalline Specimens)

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy, Fizika,  
1959, Nr 5, pp 93-101 (USSR) (+ 1 plate)

ABSTRACT: The aim of this work is the elucidation of the following problems: 1) the reason for the broadening of interference lines in X-ray photographs of metals subjected to cyclic deformation; 2) whether the change in intensity of the X-ray lines can be used as a criterion for fatigue; 3) how does the fatigue process proceed in specimens of ferrous and non-ferrous alloys of different crystal sizes up to monocrystals, and 4) whether low temperature brings about changes in the structure of metals subjected to fatigue. The authors have submitted the following metals and alloys to fatigue tests: commercially pure iron (Armco iron), cuprite, aluminium, and brass. Brass specimens were tested first. These were cylindrical in shape. Various crystal sizes ✓

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X-ray Study of the Mechanism of Fatigue in Ferrous and Non-Ferrous Materials and Alloys (Mono- and Poly-Crystalline Specimens)

were attained in these specimens by means of heat treatment. The latter were tested in a fatigue testing machine of the NU type at room temperature. One part of the specimens was tested in the annealed condition, the other part in a worked condition (work hardening was due to turning in a lathe). All tested specimens were subjected to deformation by bending to a definite degree at definite loads for different numbers of cycles. The second group of specimens was made from sheet material. The specimens were in the form of a uniform resistance beam or rectangular plate (Fig 1). One part of the specimens had a fine-grained structure (normal poly-crystalline specimens), the other part was submitted to preliminary working and subsequent recrystallisation which enabled crystals of different dimensions, from 10<sup>-3</sup> mm to several cms, to be grown. For fatigue testing the authors built an apparatus in which specimens could be bent symmetrically. Its construction was based on the principle of constant deformation (Fig 2). In this

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X-Ray Study of the Mechanism of Fatigue in Ferrous and Non-Ferrous Materials and Alloys (Mono- and Poly-Crystalline Specimens)

machine the specimens were tested at amplitudes of 1, 3, and 10 mm. Testing of all the above specimens was carried out at normal temperatures as well as at liquid nitrogen temperature. The specimens were X-rayed by the back reflection method as well as by the Laue method. The significant portion of the polycrystalline apparatus of the URS-50I was X-rayed in an ionisation apparatus of the URS-50I type. Specimens submitted to testing at liquid nitrogen temperature were subsequently X-rayed at normal temperature. In order to be able to predetermine the place of fatigue fracture of these specimens during testing, their middle portion had a different diameter from those portions of the specimen which were close to the grips of the machine. By means of heat treatment the following crystal sizes were attained in brass specimens:  $10^{-4}$  mm,  $10^{-3}$  and  $10^{-2}$  mm (vacuum annealed specimens). X-ray investigations of these specimens were carried out by the ionisation method. The investigation of finely crystalline specimens (with crystal sizes of ✓

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X-Ray Study of the Mechanism of Fatigue in Ferrous and Non-Ferrous Materials and Alloys (Mono- and Poly-Crystalline Specimens)

$10^{-4}$  mm) led to the following results. In the testing of these specimens at cyclic stresses of 14, 18 and 22 kg/mm<sup>2</sup>, and different numbers of cycles, no secondary effects (broadening of interference lines) were observed. X-ray investigation of specimens of the second group (with crystal sizes of  $10^{-3}$  mm), tested at the same cyclic stresses, exhibited a broadening of interference lines within limits of up to 1 million cycles (Fig 3). The third group of specimens (with crystal sizes of  $10^{-2}$  mm), tested under the same cycle stresses, exhibited a broadening of interference lines within the limits of testing up to 3 million cycles. The maximum broadening of the lines was 20% as compared with the initial width of a non-deformed specimen (Fig 4). Figs 5 and 6 show the dependence of the intensity of the (511) line on the number of cycles at a cycle stress of 22 kg/mm<sup>2</sup> for crystals of  $10^{-2}$  and  $10^{-4}$  cm, respectively. Fig 7 shows the distribution of points in the specimen which were X-rayed. Fig 8 shows a Laue-graph of Al before, and ✓

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E091/E191

X-Ray Study of the Mechanism of Fatigue in Ferrous and Non-Ferrous Materials and Alloys (Mono- and Poly-Crystalline Specimens)

Fig 9 after, fracture. Fig 10 is a Laue-gram for Armco iron. The physical mechanism of fracture of coarsely crystalline metals is the same for all the different metals investigated in this work. Specimens of the metals investigated, which were submitted to fatigue tests at liquid nitrogen temperature and then X-rayed at normal temperature, exhibited stronger distortions in their crystal structure. A comparison of the results of the investigation of fine grained metals with that of coarse grained ones, which essentially represent monocrystals, shows that the development of secondary effects (fragmentation of crystal blocks and crystal distortions) depends on the initial condition of the metal and is not a structural characteristic of fatigue. The change in line intensity, reflecting the development of tertiary distortions, signals the approach of fracture of the specimen, but for the time being it cannot be used as a universal criterion for fatigue, and further work in this direction is required. However, there is no doubt that

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Materials and Alloys (Mono- and Poly-Crystalline Specimens)

the "disintegrations" in the metal structure appearing in  
fatigue testing are associated with dislocations which in  
their turn cause the development of tertiary distortions  
which, in a definite measure, are responsible for  
fracture.

Card 6/6 There are 11 figures and 5 references, of which 4 are  
Soviet and 1 is English.

ASSOCIATION: Leningradskiy inzhenerno-ekonomicheskiy institut  
(Leningrad Engineering-Economics Institute) ✓

SUBMITTED: February 13, 1959

BUYKO, V.M.; MAKOGONOV, V.Ye.; TERMINASOV, Yu.S.; TOROPOV, A.M.

X-ray investigation of the mechanism of fatigue in ferrous  
and nonferrous metals and alloys. Izv.vys.ucheb.zav.; fiz.  
no.5:93-101 '59. (MIRA 13:4)

1. Leningradskiy inzhenerno-ekonomicheskiy institut.  
(Metallography) (Metals—Fatigue)

88924

S/058/61/000/001/006/008  
A001/A00118.8200  
10.9220

Translation from: Referativnyy zhurnal, Fizika, 1961, No. 1, p. 315-316, # 1E311

AUTHORS: Terminasov, Yu. S., Toropov, A. M.

TITLE: X-Ray Examination of Distortions in Crystalline Structure of Steel 45  
Aluminum and Red Copper Subjected to Fatigue Tests

PERIODICAL: "Tr. Leningr. inzh.-ekon. in-ta", 1959, No. 28, pp. 51-60

TEXT: The authors carried out fatigue tests of annealed specimens of Al, Cu and steel 45 (0.45% C) subjected to alternating bending at room temperature and that of liquid nitrogen. The X-ray examination was conducted with the ionization recording method and by harmonic analysis of the curves of intensities of X-ray interferences and by measuring integral intensity. It turned out that fatigue process in ferrous and non-ferrous metals was characterized by development of the domain structure, microdeformations and 3-order deformations. The part of each of these factors changes when conditions of fatigue testing alter. At a low temperature the part of the thermal effect is excluded, and distortions of crystalline structure manifest themselves in the most pronounced way. A great

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S/058/61/000/001/006/008  
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X-Ray Examination of Distortions in Crystalline Structure of Steel 45, Aluminum and Red Copper Subjected to Fatigue Tests

effect on intensity of interference lines is exerted by extinction which prevents the manifestation of 3-order deformations at initial phases of fatigue tests. The roentgenographic criterion of fatigue for annealed specimens can be employed only under conditions of fine-domain structure which excludes extinction effects.

L. Mirkin

Translator's note: This is the full translation of the original Russian abstract.

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89664

18.8200

S/149/61/000/002/013/017  
A006/A001

AUTHORS: Terminasov, Yu.S., Toropov, A.M.

TITLE: Roentgenographical Investigation of the Crystal Structure of Non-Ferrous Metals Under Conditions of Alternate Loading at Room and Low Temperatures

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy, Tsvetnaya metallurgiya, 1961, No. 2, pp. 116 - 122

TEXT: Until the present, roentgenographical investigations of non-ferrous metals subjected to alternate loading were made at room temperatures (Ref. 1, 2). To exclude the effect of heat on the deformation of the crystal structure of the metal, the authors carried out tests at -196°C with aluminum and copper specimens. Roentgenograms were taken by the photographic and the ionization method. The specimens were subjected to fatigue tests at alternate loads in liquid nitrogen on a special device (Ref. 4) representing a hinged four-section mechanism with a crankshaft whose length could be varied to the required amplitude. Stepped tests were made at each amplitude. The photographic method and the processing of results obtained were analogous to those described in Reference 3. Radiographs were taken with a KP0C-1 (KROS-1) camera, using a  $\text{GBCN}$  (BVSL) tube with a copper

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Roentgenographical Investigation of the Crystal Structure of Non-Ferrous Metals  
Under Conditions of Alternate Loading at Room and Low Temperatures

anode mounted on a YPC-55 (URS-55) device. During exposure the specimens (an aluminum foil standard or an annealed copper specimen) were rotated. They were fastened by a special device assuring the incidence of the X-ray beam onto the same spot. Photometric readings were taken with a MF-2 (MF-2) microphotometer. The line width of the  $K_{\alpha}$ -doublet was determined by dividing the surface of the curve corresponding to the interference line by the maximum height of the curve. Changes in the width of the line indicated changes in the effects of second order. The surface of the  $K_{\alpha}$ -doublet curve was taken as integral intensity of the line, when evaluating distortions of the third order, which were estimated by changes in the relation  $I(hkl)$ . When using the ionization method roentgenograms were

taken with the aid of an X-ray apparatus with ionization recording of interference maxima. A BCBN (BSVI) tube with a copper anode and filtrated  $K_{\alpha}$ -irradiation were employed. The width of  $K_{\alpha}$ -lines was determined according to Stokes (Ref.5); the components of  $K_{\alpha}$ -doublets were separated by the Rechinger method (Ref. 6). The magnitude of crystal domains and microdistortions of the crystal lattice were

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Roentgenographical Investigation of the Crystal Structure of Non-Ferrous Metals  
Under Conditions of Alternate Loading at Room and Low Temperatures

determined by harmonic analysis. The experiments yielded the following results: Effects of the second order (fragmentation of crystal domains and micro-distortions) developed in the crystal structure of aluminum only at heavy loads (5 mm amplitude). It was established that the fatigue process of copper was accompanied by fragmentation of crystal domains, proceeding during the initial stage of the tests, and by a slight increase of micro-distortions. Deformations of the third order appear only after discontinuation of extinction effect on the intensity of the lines, although the development of these distortions takes place probably at the beginning of deformation of the specimens; during the initial stage of tests, however, their effect on the intensity of the lines is superimposed by the effect of extinction. Fragmentation of crystal domains ends with the initial stage of the tests, and therefore the distortions of third order manifest themselves already at relatively early stages of the tests.

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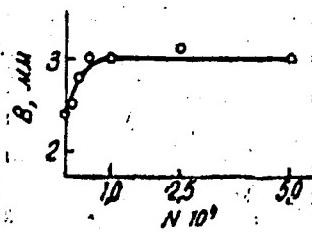
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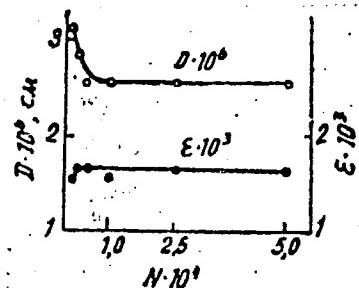
**Roentgenographical Investigation of the Crystal Structure of Non-Ferrous Metals  
Under Conditions of Alternate Loading at Room and Low Temperatures**

Figure 1:

Dependence of the width of line (222) of aluminum on the number of cycles at 5 mm amplitudes and room temperature

Figure 2:

Dependence of crystal domain sizes and microdistortions of aluminum on the number of cycles at 5 mm amplitude and room temperature



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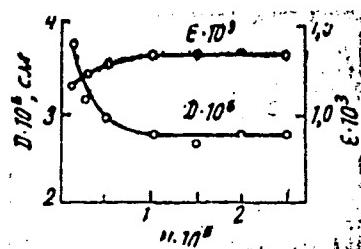
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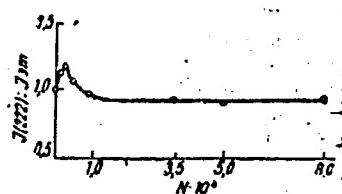
Roentgenographical Investigation of the Crystal Structure of Non-Ferrous Metals  
Under Conditions of Alternate Loading at Room and Low Temperatures

Figure 3:

Dependence of crystal domain size and microdistortions of copper on the number of cycles at 3 mm amplitude and room temperature

Figure 4:

Dependence of  $I_{222}/I_{\text{std}}$  of aluminum on the number of cycles at 5 mm amplitude and room temperature



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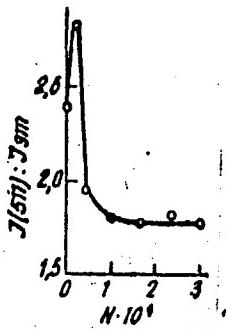
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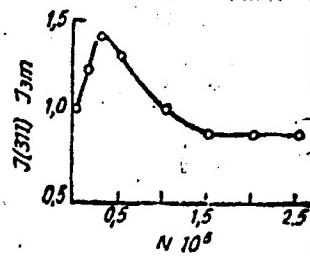
Roentgenographical Investigation of the Crystal Structure of Non-Ferrous Metals  
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Figure 5:

Dependence of  $I/511/I_{st}$  of aluminum on the number of cycles at 5 mm amplitude and room temperature (Photographical method)

Figure 6:

Dependence of  $I/311/I_{st}$  of copper on the number of cycles at 5 mm amplitude and room temperature



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Roentgenographical Investigation of the Crystal Structure of Non-Ferrous Metals  
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There are 6 figures and 7 references; 5 Soviet and 2 Non-Soviet.

ASSOCIATIONS: Leningradskiy inzhenerno-ekonomicheskiy institut (Leningrad Econo-  
mical Engineering Institute). Kafedra fiziki (Department of  
Physics)

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(MIRA 14:6)

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(Nonferrous metals--Metallography)  
(X-ray chrystallography)